

Overview of Cassava Value Chain Analysis

The classic definition most often applied to value chains is that the term value chain refers to “the full range of activities that are required to bring a product (or a service) from conception through the different phases of production to delivery to final consumers and disposal after use” (Kaplinsky 1999¹).

Value chain analysis can be utilized in a narrow sense to refer to activities within a single firm to bring a product to market. However, it is more common to take a broader view and define a value chain as looking at the complex range of activities implemented by various actors (primary producers, processors, traders, service providers) to bring a raw material through a chain to the sale of the final product. This broad view starts from the production system of the raw materials and moves along the linkages with other actors and enterprises engaged in trading, assembling, processing, etc. In addition, value chain analysis is concerned with the characteristics of backward and forward linkages between actors in the chain.

Value chain analysis takes a holistic approach to analysis and includes consideration of direct actors, indirect actors and external influences. Direct actors are defined as those who are directly involved in the processes of bring the product from production to consumption – generally meaning those who take ownership and possession of the product. Indirect actors are those who have an influence on the value chain, but who so not take direct ownership and possession of the product. External influences that impact on the value chain include economic, environmental and socio-cultural forces.

¹ Kaplinsky, R. (1999). “Globalisation and Unequalization: What Can Be Learned from Value Chain Analysis.” *Journal of Development Studies* 37(2): 117-146.

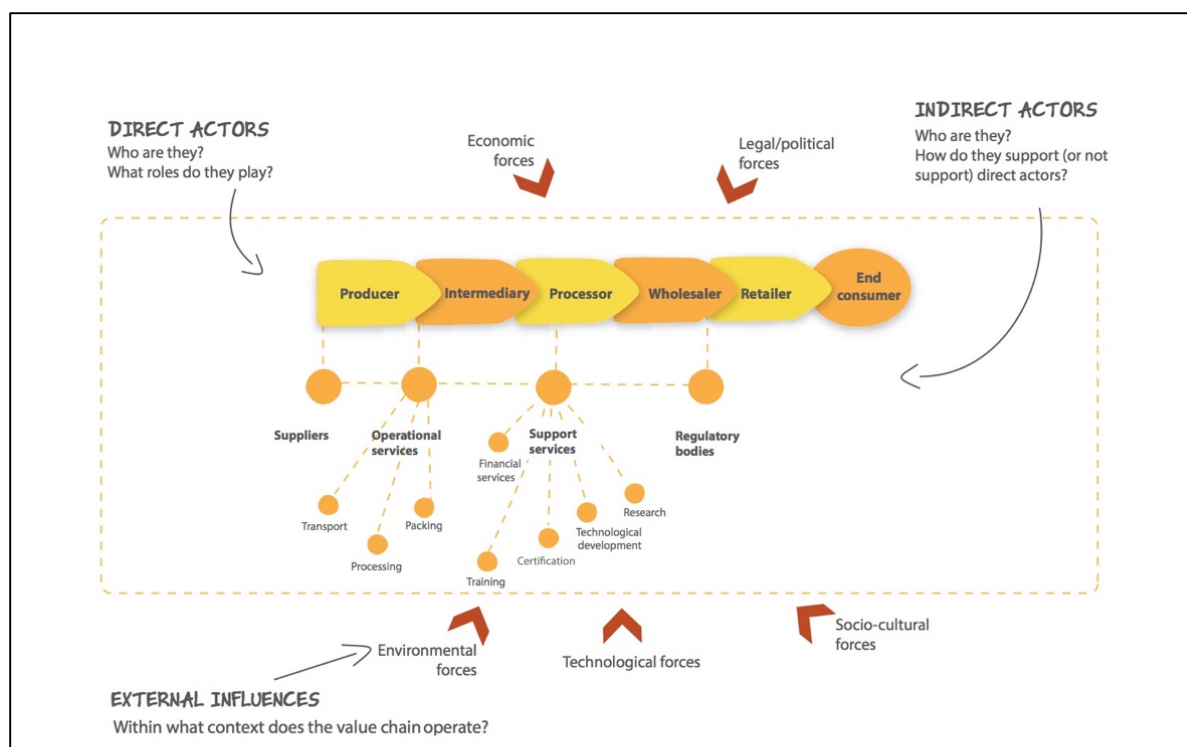


Figure 1: Actors and influences in value chain analysis (Source: LINK 2.0 Methodology, CIAT, 2014)

Kaplinsky and Morris (2001²) highlight four aspects of value-chain analysis which make it a particularly useful technique to apply to agricultural development.

Systematic Mapping - Value-chain analysis systematically maps the actors participating in the production, distribution, marketing, and sales of a particular product (or products). This mapping assesses the characteristics of actors, profit and cost structures, flows of goods throughout the chain, employment characteristics, and the destination and volumes of domestic and foreign sales.

Distribution of Benefits - Value-chain analysis can play a key role in identifying the distribution of benefits between actors in the chain. That is, through the analysis of margins and profits within the chain, it is possible to determine who benefits from participation in the chain and which actors could benefit from increased support or organisation.

Upgrading - Value-chain analysis can be used to examine the role of upgrading within the chain. Upgrading can involve improvements in quality and product design or diversification in the product lines served, allowing producers to gain higher value. An analysis of the upgrading process includes an assessment of the profitability of actors within the value chain as well as information on limitations that are currently present.

Governance - Value-chain analysis highlights the role of governance in the value-chain, which can be internal or external. Governance within a value-chain refers to the structure of relationships and coordination mechanisms that exist between actors in the value-chain. Governance is a broad concept which basically ensures that interactions between chain participants are organised, rather than being simply random.

Value chain analyses were conducted at each of the site and consisted of two interlinked components: (i) value chain training; and (ii) fieldwork (farmer focus group discussions and

² Kaplinsky, R. and M. Morris (2001). *A Handbook for Value Chain Research*. Brighton, United Kingdom, Institute of Development Studies, University of Sussex.

value chain participant surveys). The value chain analyses were relatively rapid, with around 6-7 days allocated per site.

Value Chain Training

Value chain training was undertaken over a 1.5 – 2 day period in each site (in Cambodia and Vietnam) or in a central location (Indonesia and Lao PDR).

The key objectives of the value chain training exercise were:

- (i) participants gain understanding of basic principles, theory and application of value chain analysis;
- (ii) participants complete basic value mapping of target Cassava value chains and fill up previously missing information;
- (iii) participants identify missing information and prioritize key information for collection during fieldwork; and
- (iv) participants finalize organization for fieldwork including final identification of key stakeholders and information to be gathered.

The key training resource utilized was the third edition of the toolbox “Making Value Chains Work Better for the Poor” developed under the Making Markets Work Better for the Poor Project, supported by ADB and DFID³. Given the limited time availability, the training concentrated on the toolbox Part 1 Concepts and Part 2 Tool 1 Value Chain Mapping. The training also covered gender and social inclusion in value chain analysis.

While the training equipped students with a basic theoretic knowledge of value chain analysis through traditional classroom teaching, a greater concentration was put on student learning through practical value chain mapping exercises. This was greatly facilitated by the mix of students in the training, including team members from central level research institutes and universities and representatives from the local level, including farmers, extension workers and local government officers.

³ Purcell, T., Gniel, S., van Gent, R., Johnson, A. and Smith, D. (2008) Making Value Chains Work Better for the Poor: A Toolbox for Practitioners of Value Chain Analysis, DFID/ADB October 2008.



Figure 2: Hands on value chain training activities undertaken in five locations in four countries (Clockwise from top left: Son La, Vietnam; Kota Batu, Indonesia; Vientiane, Lao PDR; Dak Lak, Vietnam and Kratie, Cambodia)

The main practical training activities for participants were the preparation and presentation of four interrelated value chain maps based on the cassava value chains in the local area. These four maps provide a first picture of the cassava value chains and form the basis of planning of the subsequent fieldwork, including fieldwork locations, farmer groups and targeted value chain actors. The value chain maps were refined after the fieldwork to take into account additional information obtained in farmer focus groups and value chain actor surveys.

Gender and Social Inclusion Mapping

Gender and social inclusion mapping of the value chain is undertaken to highlight the heterogeneous nature of actors at various stages of the value chain and to explore the differing characteristics of production, power relations and the differential impact of change between social groups.

The first part of the mapping exercise is to identify differentiated social groups within a value chain actor category. For example, rather than using a homogenous grouping (cassava farmers), heterogeneous classifications could be developed based on social grouping – female and male farmers; poor, medium and better-off farmers or groupings based on ethnicity.

Once the groupings are developed, the characteristics of production for each group are discussed and recorded. Key characteristics include – land size, variety type, contracts,

labour source, fertilizer use, land preparation, credit access and credit provision, type of product sold etc.

Power relations between different social groupings and also between the social group and other value chain actors (for example between poor farmers and input suppliers vs. better-off farmers and input suppliers) are discussed and recorded. Finally, likely change scenarios are elaborated (e.g. decline in cassava price, opening of new factory) and the potential impact on each social group is discussed and recorded. Figure 3 shows the basic matrix utilized for gender and social inclusion mapping and some examples from Dak Lak are shown in Figure 4.

	Group 1	Group 2	Group 3
Characteristics of Production			
Power relations			
Impact of Change			

Figure 3: Matrix for gender and social inclusion mapping

The image shows two pages of handwritten notes. The left page is titled 'Social inclusion mapping from Dak Lak' and is organized into three columns representing ethnic groups: Ê ĐÊ (TÂY CHÔ), H'MÔNG (PHÍA BẮC), and KINH. The right page is organized into four columns representing poverty status: NGHÈO, TB, GIÀU, and GIỚI THIỆU. The notes contain detailed information about production characteristics, power relations, and the impact of change for each group.

	Ê ĐÊ (TÂY CHÔ)	H'MÔNG (PHÍA BẮC)	KINH
Đặc điểm sản xuất	Quy mô sản xuất rất lớn ít đầu tư thâm canh Áp dụng KHKT còn hạn chế sản xuất chủ yếu bán đất bằng và 1 phần đất trồng bán sản tươi	Quy mô sản xuất vừa khá lớn Có đầu tư, là đầu tư nông nghiệp như là kinh doanh Sản xuất tại đất trồng Bán sản tươi & lát	Quy mô sản xuất lớn Có đầu tư thâm canh Biết áp dụng T&K kỹ thuật Độc canh, bán sản tươi Đất bằng
Quan hệ quyền lực	Lệ thuộc vào người cung cấp vật tư đầu vào Bị ép giá ít có quyền lựa chọn người thu mua	Có quyền lựa chọn người thu mua -	Bán trực tiếp cho nhà máy sản xuất thủ công Giá cao hơn Có quyền lựa chọn người thu mua
Đặc điểm của sự thay đổi	áp dụng chính sách Tăng diện tích	Áp dụng nhanh Tăng S, tăng đầu tư, chuyển đổi CCT	Áp dụng nhanh Chuyển đổi CCT nhanh

Figure 4: Social inclusion mapping from Dak Lak (left – farmers differentiated by ethnic grouping; right – farmers differentiated by poverty status)

Process Mapping

Process mapping is the core of any value chain mapping exercise and is a way of representing the key characteristics of the value chain and value chain actors in an accessible format. Process mapping includes the following key information:

Processes – the core processes that occur from inputs to raw material through to final consumption of end products. Typical processes would include input supply, production, collection, trading, processing, wholesaling and retailing

Actors – these are the people involved in the value chain. Each process identified will have some actors associated with that process. The characterization of actors can be relatively simple (e.g. “farmers”) or more complex (e.g. “poor farmers, medium farmers, better-off farmers”). The level of complexity of characterization of actors can be guided by the results of the gender and social equity mapping above.

Activities – the activities are what is actually done by the actors at each process. This should be as detailed as practical – rather than “cassava farming” as an activity, it is preferable to note “land preparation, planting, weeding, fertilizing, harvesting”. If there are more than one group of actors defined for a value chain process, then differentiated activities should also be defined for each group.

Input and output form – the form of the core product at the input and output stage of each of the core processes of the value chain. For example, the input form of cassava to starch processing is fresh cassava root and the output form is starch and by-products, including fibre.

External services – any external services that are provided to value chain actors at each process level within the value chain should be identified. Where possible, differentiated services can be identified for different social groups. Mapping these external services can identify potential entry points for value chain interventions.

Constraints and potential solutions – various constraints exist at all processes within a value chain. For example, there could be constraints to increased productivity, constraints to upgrading or constraints to sustainable involvement of the poor. The identification of these constraints and initial brainstorming around potential solutions is an important part of identifying potential intervention strategies for the project.

Process	Process 1	Process 2	Process 3	Process 4....
Actors				
Activities				
Input Form				
Output Form				
External Services				
Constraints				
Possible Solutions				

Figure 5: Matrix for process mapping

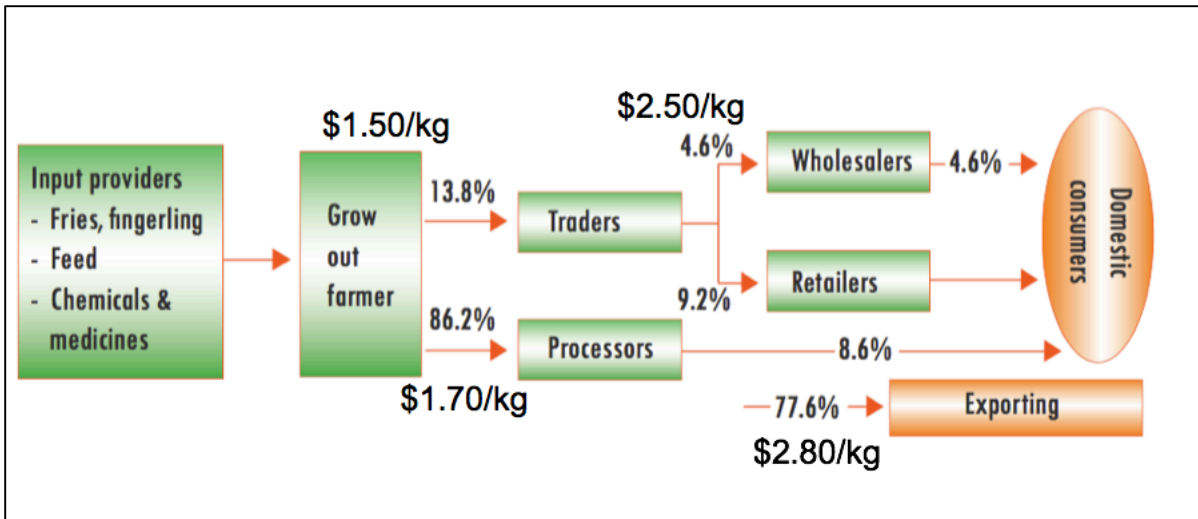


Figure 7: Example flow and value map

The flow/value map can be further enhanced by including information about the relationships between the value chain actors. At the most basic level the relationship could be described as being either a persistent relationship or a spot market relationship. Persistent relationships are relationships where actors undertake numerous transactions with each other over a period of time and have built up trust and mutual understanding. This may involve a formalized, written contract between the two parties, but this does not always have to be the case.

Spot market relationships are relationships that exist for a specific transaction. Actors make a transaction (including agreement on price and other requirements) purely for the duration and scope of that specific transaction.

These differing relationships can be represented on the map by different line types, as shown in Figure 8.

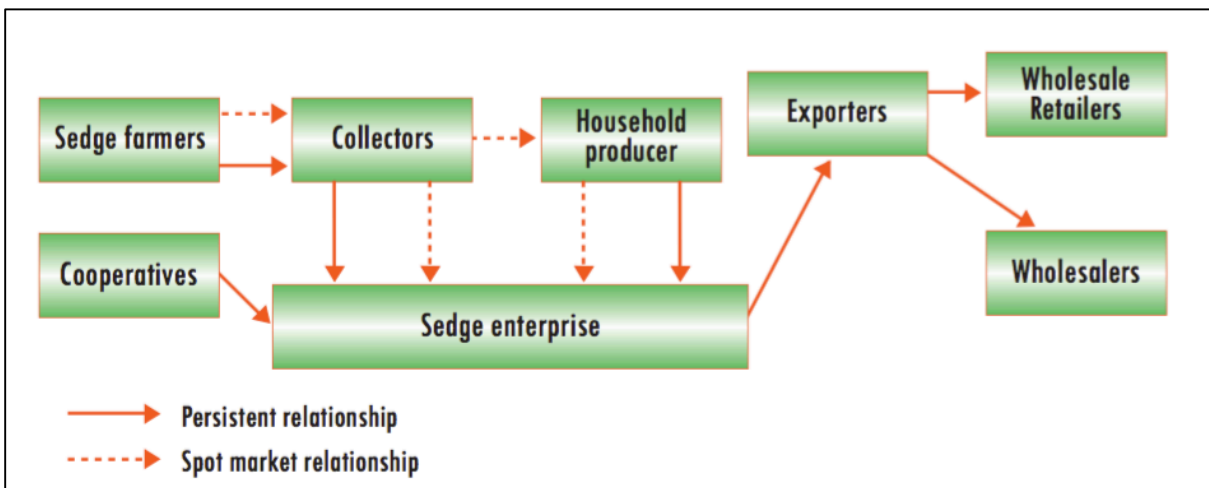


Figure 8: Example relationship map

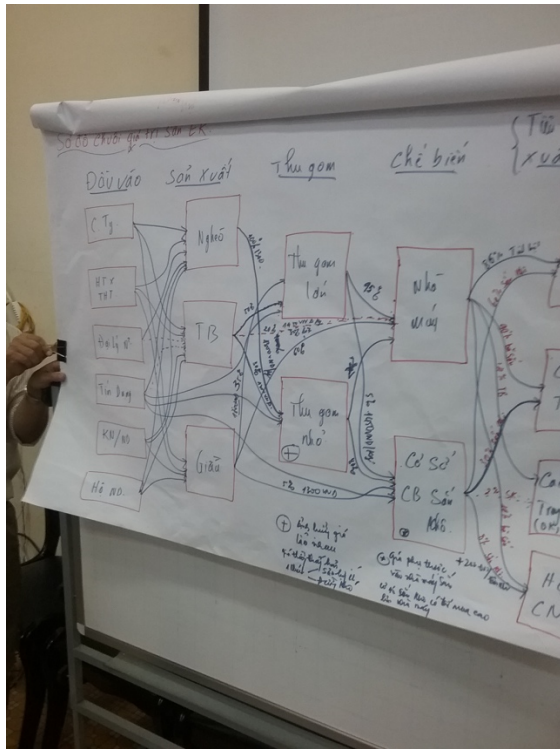


Figure 9: Flow, value and relationship map, Ea Kar, Dak Lak, Vietnam

Geographic Mapping

Once the social inclusion, process and flow, value and relationship maps are completed, it is relatively easy to transfer the information to a geographic map of the study region. The physical locations of the various actors and key processes can be marked on the map, as well as an indication of the key product flow routes. Having the key information about the value chain on a geographic map greatly facilitates the organization of the subsequent fieldwork to collect additional information.

Figure 10 shows a geographic value chain map from Cambodia. The map includes an indication of key cassava production areas as well as identification of collection points operated by traders and the key transport routes for cassava root and chip export to Vietnam. This map was very useful in planning the fieldwork activities in Kratie.

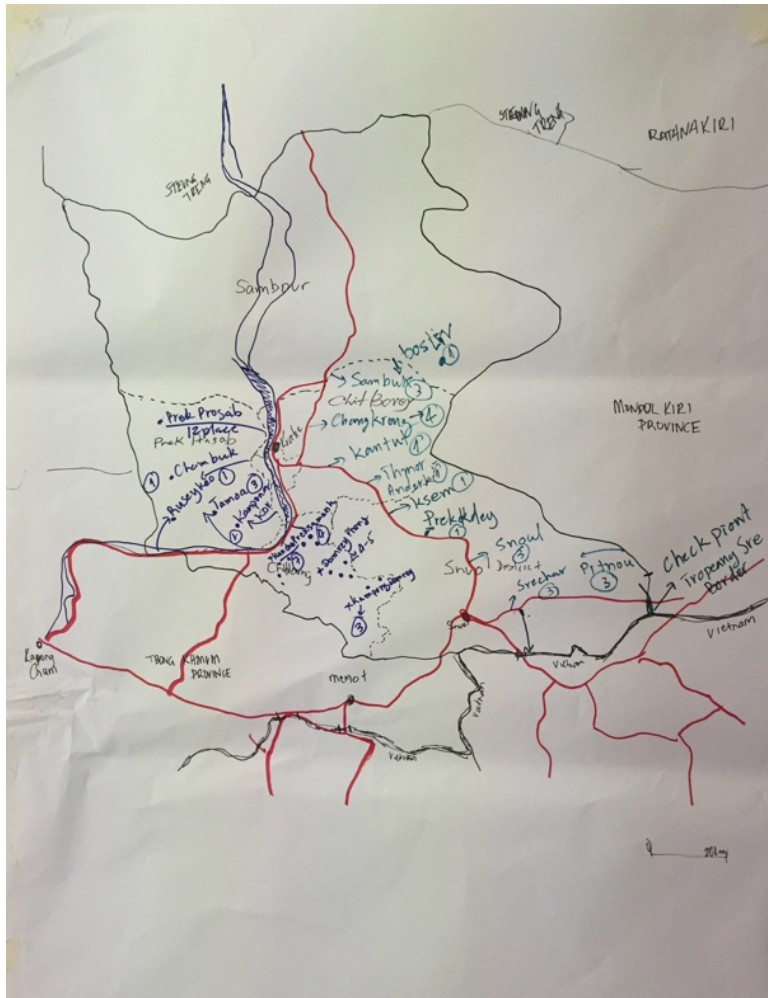


Figure 10: Geographic map of cassava value chain, Kratie, Cambodia

Fieldwork

The fieldwork portion of the value chain analysis was undertaken after the completion of the training. Fieldwork in each site was undertaken over 4-5 days and consisted of two interlinked activities: Farmer Focus Group Discussions and Value Chain Actor Surveys. The two activities were conducted simultaneously by two separate teams. The teams were able to share information and discuss their activities at the end of each fieldwork day.

The overall objectives of the fieldwork were to:

- (i) gather relevant primary information from key informants at various stages in the value chain;
- (ii) finalize value chain mapping and analysis of relationships and linkages based on discussions in the workshop/training and information gathered in the fieldwork; and
- (iii) based on the above, identify and prioritise potential entry points for project intervention in the value chain.

Focus Group Discussions

Focus group discussions were undertaken with groups of around 20 farmers in a number of communities in each site. The focus group discussions were run by a team of around 5 facilitators and reporters and concentrated on 9 key information gathering activities:

Activity 1 Basic Village Information - gathering basic socio-economic and agronomic information about the village and basic information on any farmer groups operating in the village.

Activity 2 Livelihood Activities - gathering information on agricultural activities, off-farm income and non-farm activities and remittances. As far as possible, the information gathered is disaggregated by poverty status and by male and female household members.

Activity 3 History of Cassava Production in the Village - gathering information on key village events including the start of cassava production with a focus on changes in cassava production and marketing arrangements.

Activity 4 Seasonal calendar - gathering month-by-month information on rainfall, food availability, key cropping activities for cassava and other crops (e.g. Paddy rice, upland rice, maize etc.), key activities for livestock raising and key labour stress periods for both men and women. In addition, detailed gender roles for each of the key cropping and livestock activities were collected.



Figure 11: Farmer focus group discussions gathering information on cropping calendar (left) and cassava production budget (right), Kratie, Cambodia.

Activity 5 Cassava production budget - gathering information on costs of land preparation, varieties, seed system, fertility management, weed management and post-harvest as well as information on intercropping, cassava yields and prices of roots and chips.

Activity 6 Cassava utilisation and value chain - gathering information on the use of cassava chain on farm (own consumption, feeding to livestock), what products are sold (roots, chips), who makes decisions about selling, who and where the product is sold to, what contractual or other relationship have to the buyer.

Activity 7 Ranking of importance of activities - gathering information on the relative importance of various activities in terms of household food security, household cash income and use of labour. Disaggregated information was gathered for better off and poor households, and in addition the farmer group was split into male and female sub-groups for this activity.

Activity 8 Problems and constraints - gathering information on the major constraints or problems with cassava production, including access to planting material, labour availability, soil fertility, soil erosion, pests and disease and access to credit.

Activity 9 Potential interventions and ranking - gathering information on farmers' opinions on potential interventions to enhance the sustainability of cassava production, including new varieties for consumption or processing, providing information on appropriate fertilizer rates, soil conservation options, intercropping and post-harvest techniques.

Value Chain Actor Survey

The value chain actor survey targeted key participants in the value chain as initially identified by participants during the value chain training exercise. Further actors to be included in the survey were identified during initial interviews. These additional actors were included in the schedule where possible, given time constraints and challenges with gaining permission for interviews at short notice.

The value chain actor survey was undertaken by a small team (2-3 people), with one team member administering a formal survey and the other team members taking notes, drafting product flow maps and clarifying responses. Between 4 and 12 surveys were undertaken at each site over a 4 -5 day period. Paper based surveys were used in Lao PDR and Cambodia and electronic surveys using the Commcare app⁴ on android tablets were utilized in Indonesia and Vietnam.



Figure 12: Administering paper-based and electronic versions of the value chain actor survey (left: Cambodia and right: Indonesia)

The formal survey consisted of 12 sections, of which the first 6 sections are directly related to information gathering for value chain mapping and characterization and the remaining 6 sections gather technical information relating to potential interventions under the project.

Section 1 Actor Information – gathering basic demographic and business information about value chain actor

Section 2 Purchasing – gathering information about product types purchased, quantity purchased, purchase price, relationship with sellers, information flows and challenges.

Section 3 Buying - gathering information about product types sold, quantity sold, selling price, relationship with buyers, information flows and challenges.

Section 4 Cost Structure – gathering information on key elements of variable and fixed costs in order to be able to accurately estimate gross and net margins.

Section 5 Access to credit and provision of credit – gathering information on amounts and conditions of loans taken to conduct business and provision of credit to suppliers.

⁴ Available for android devices on the Google Play Store

Section 6 Access to information and training – gathering information on the sources and quality of information available to value chain actors.

Section 7 Cassava Variety – gathering information on existing cassava variety use, sources and knowledge and interest in obtaining new varieties.

Section 8 Fertilizer Use - gathering information on existing fertilizer use, sources and knowledge and interest in participating in trials of improved fertilizer use.

Section 9 Land Preparation - gathering information on knowledge and practice relating to land preparation and interest in participating in trials of improved land preparation techniques.

Section 10 Soil Conservation - gathering information on knowledge and practice relating to soil conservation and interest in participating in trials of improved soil conservation techniques.

Section 11 Pest and Disease Management - gathering information on the extent of knowledge of existing pest and diseases and current management techniques.

Section 12 Weed Control - gathering information on knowledge and practice relating to weed control and interest in participating in trials of improved weed control techniques.

At the same time as the administering of the formal survey, other team members were utilizing the Drawexpress⁵ app to prepare maps of the value chain actors buying and selling product flows based on the information gathered in the formal survey. This map was then presented to the value chain actor for verification before being finalized (see Figure 13).

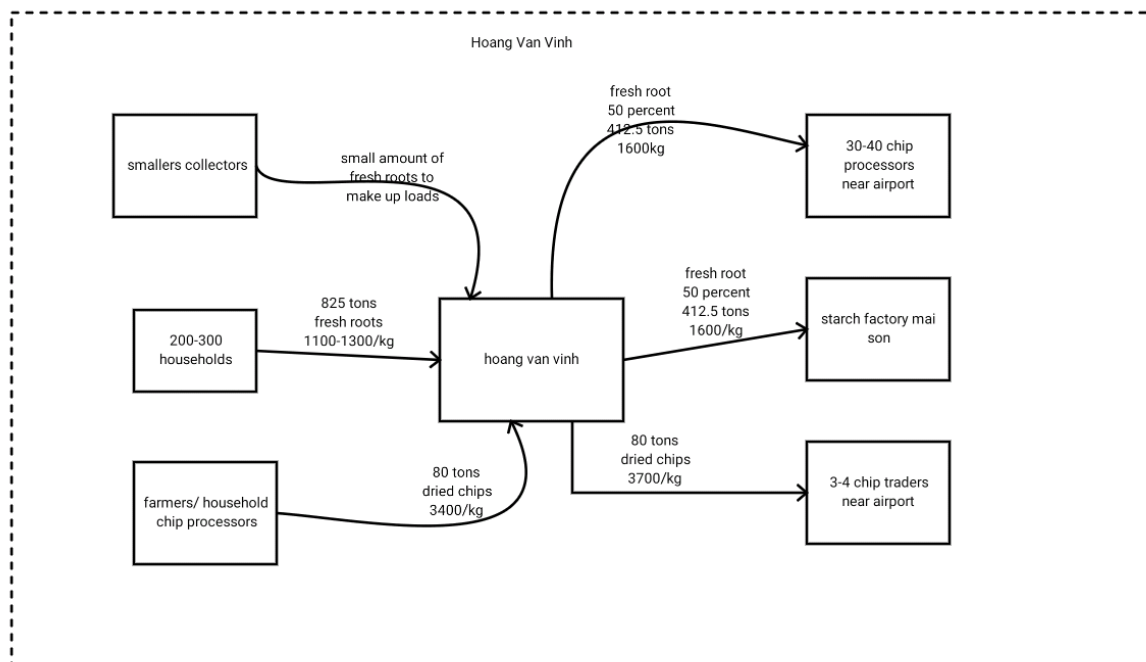


Figure 13: Example map of product flows developed during value chain actor survey and checked prior to finalization

⁵ Available for android devices on the Google Play Store and as Draw Express Diagram for IOS devices from Apple App store.

Lessons Learned

- Participation of both national level partners and local level key informants
- Hands on/practical analysis of value chain is better than theoretical work
- Translation of slides, toolbook, FGD material and value chain actor survey
- Having separate teams for focus group discussions and value chain actor surveys is more efficient in the field, but it can lead to a lack of information sharing
- Tablets are generally very efficient for information collection and especially for data entry. Enthusiasm was high from both younger and middle-aged researchers. Tablets work best for multiple choice and numeric questions. They are far less suitable for open-ended questions.
- Using the Drawexpress app to create value chain maps during interviews is a quick way to double check the accuracy of collected information about value chain participants, product flows, volumes and prices.